VEGETATION

Concepts

- Wetlands support hydrophytic vegetation
- To evaluate whether a plant community is hydrophytic, need to determine what species are dominant and how many of the dominant species are hydrophytes

Hydrophytic Vegetation

Prevalence/Dominance Definition (1987 Manual):

Dominant plant species are those that contribute more to the character of a plant community than other species present, as estimated or measured in terms of some ecological parameter or parameters.

Hydrophyte

Any macrophyte that grows in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content

Hydrophytic Vegetation Criteria and Field Indicators

Basic Rule for Hydrophytic Vegetation

Dominance Test:

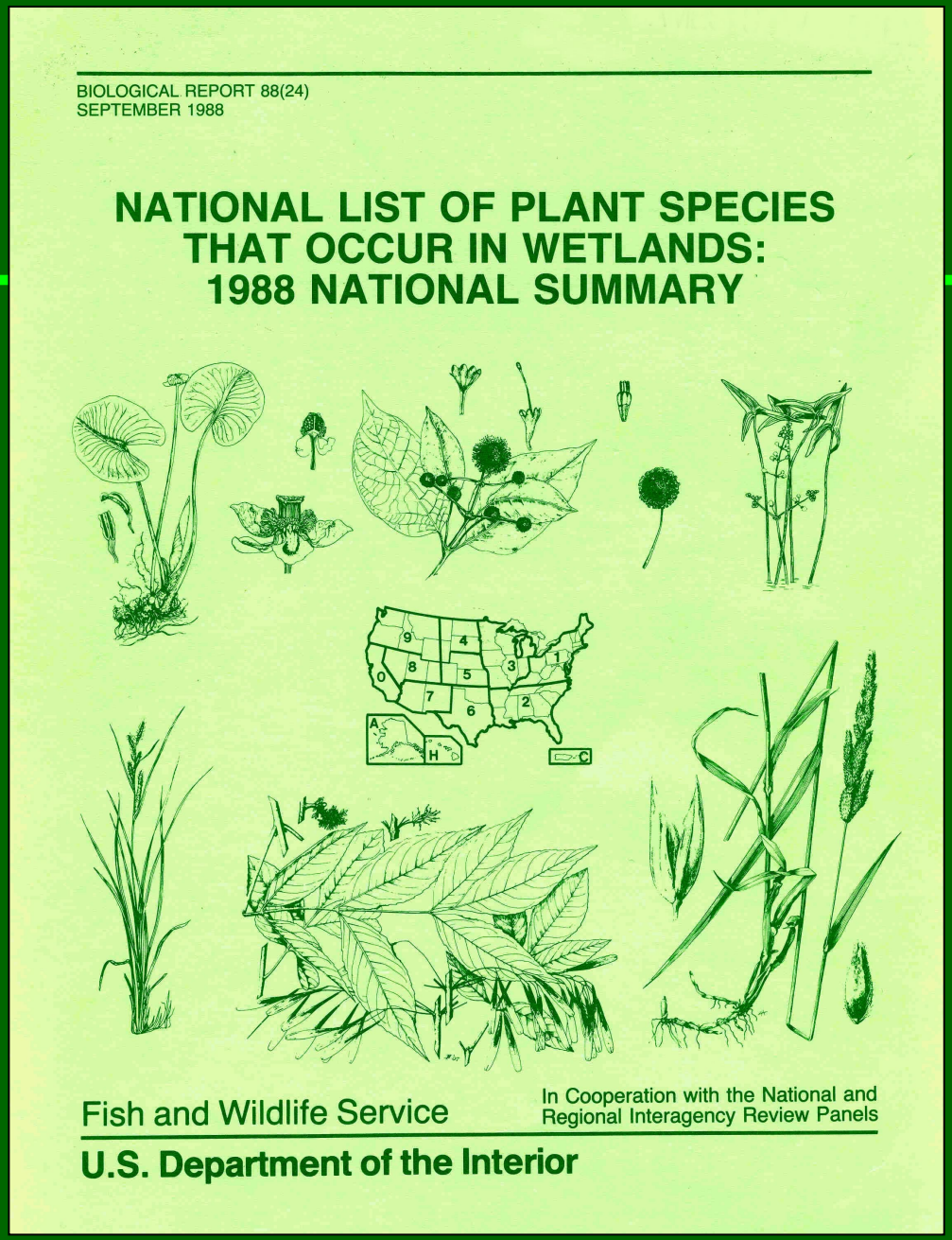
More than 50% of the dominant species are OBL, FACW, or FAC

Prevalence Index:

Prevalence Index if $\leq$ 3.00, also based on indicator status

Plant Lists

1988 Edition

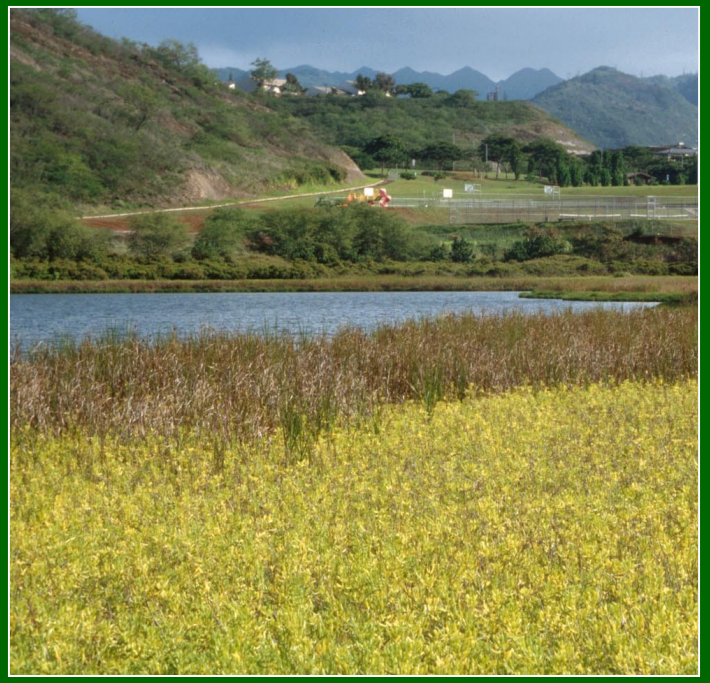

BIOLOGICAL REPORT 88(24)
SEPTEMBER 1988
NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: 1988 NATIONAL SUMMARY
Fish and Wildlife Service
In Cooperation with the National and Regional Interagency Review Panels
U.S. Department of the Interior

Wetland Indicator Status

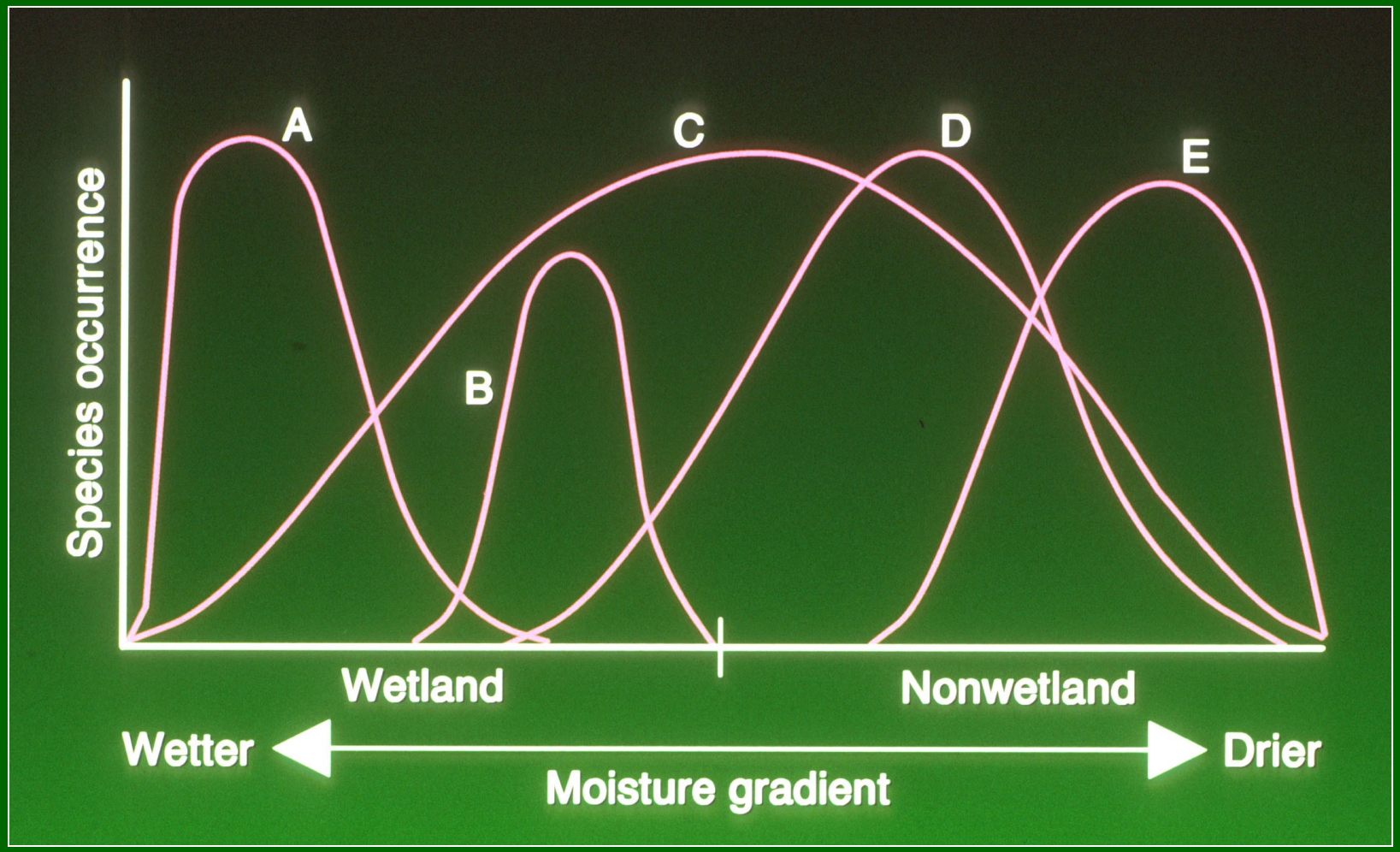
Indicator category	Symbol	Occurrence in Wetlands
Obligate wetland plants	OBL	> 99%
Facultative wetland plants	FACW	67 - 99%
Facultative plants	FAC	34 - 66%
Facultative upland plants	FACU	1 - 33%
Obligate upland plants	UPL	< 1%

Plant Distributions

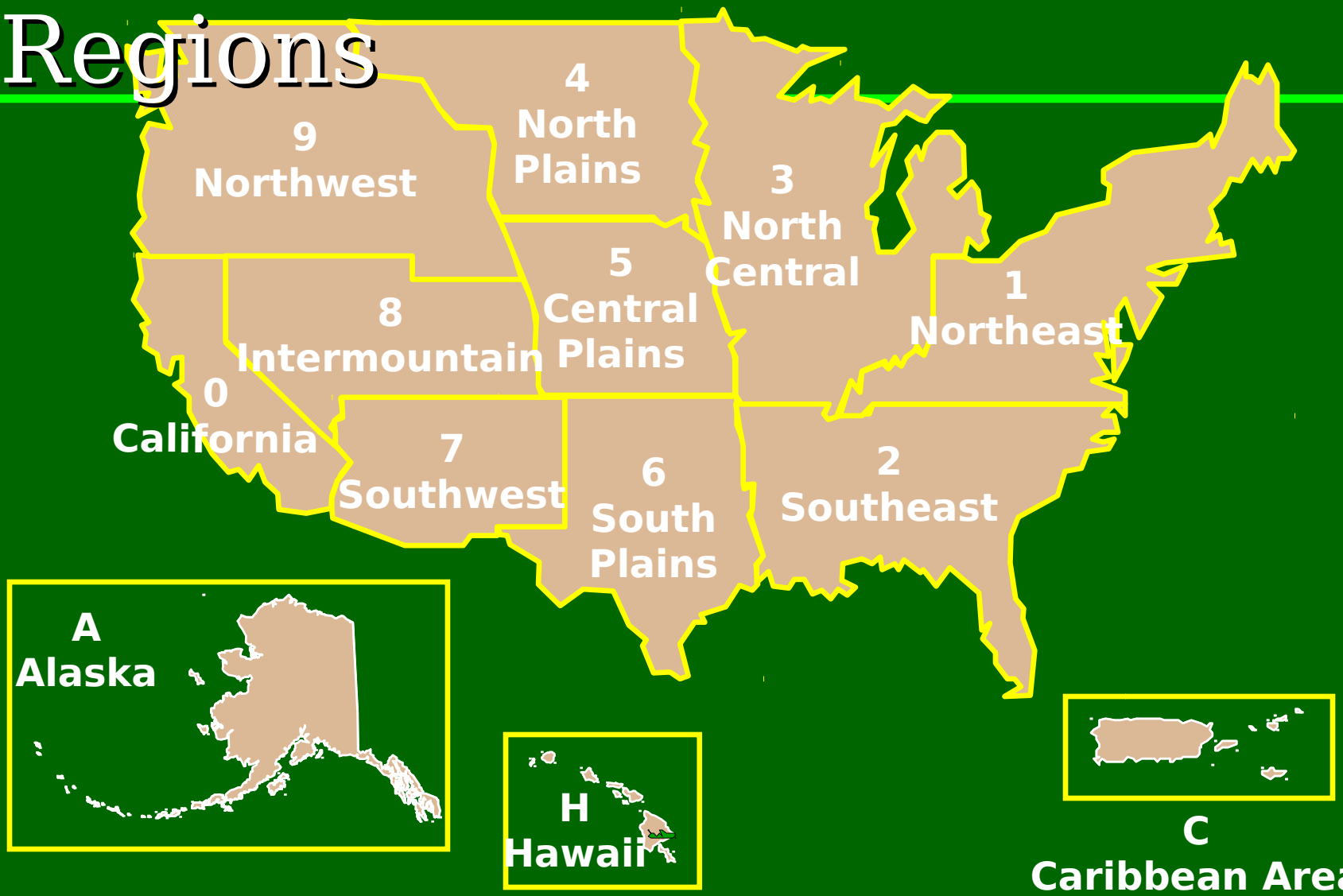
Vegetation zones or associations



Plant Distributions



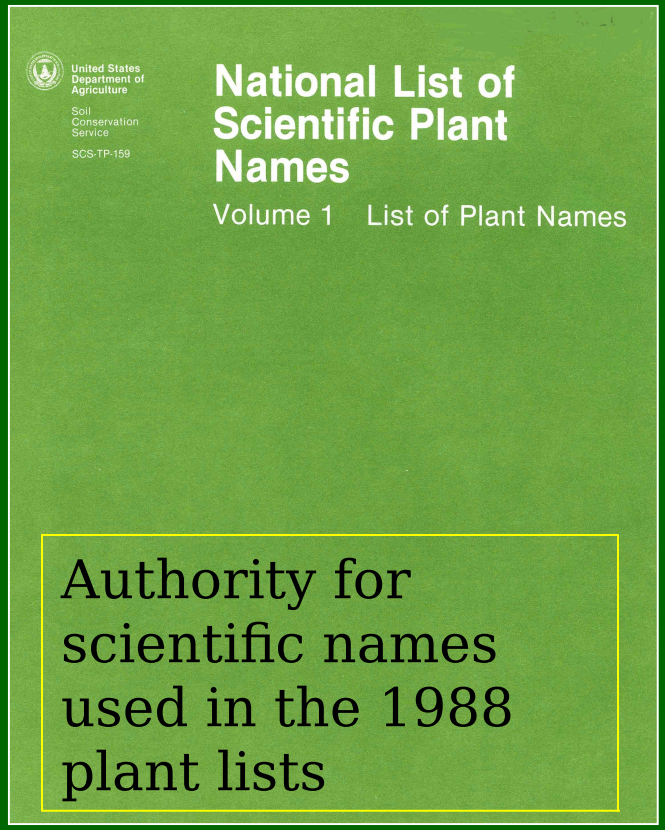
Plant List Regions



Plant Lists

If a plant is not listed on the plant list:

- Using an incorrect name or a synonym
  - Check the “Synonymy” section of the plant list
- It is UPL and not listed
- No Indicator status = NI


United States Department of Agriculture
Soil Conservation Service
SCS-TP-159
National List of Scientific Plant Names
Volume 1 List of Plant Names

Authority for scientific names used in the 1988 plant lists

OBL Plants in Alaska

Sweet gale
(*Myrica gale)*

Bog rosema
(*Andromed*
polifolia)

OBL Plants in Alaska

Small cranberry (*Vaccinium oxycoccus)*

Water sedge (*Carex aquatilis*)

OBL Plants in Alaska

Hippuris vulgaris, emergent in an aquatic bed of *Myriophyllum exalbescens*.

Mare's-tail
(*Hippuris vulgaris)*

Narrow leaf
cotton grass
(Eriophorum

FACW Plants in AK

Black Spruce (*Picea mariana*)

Marsh horse-tail (*Equisetum palustre*)

FAC Plants in AK

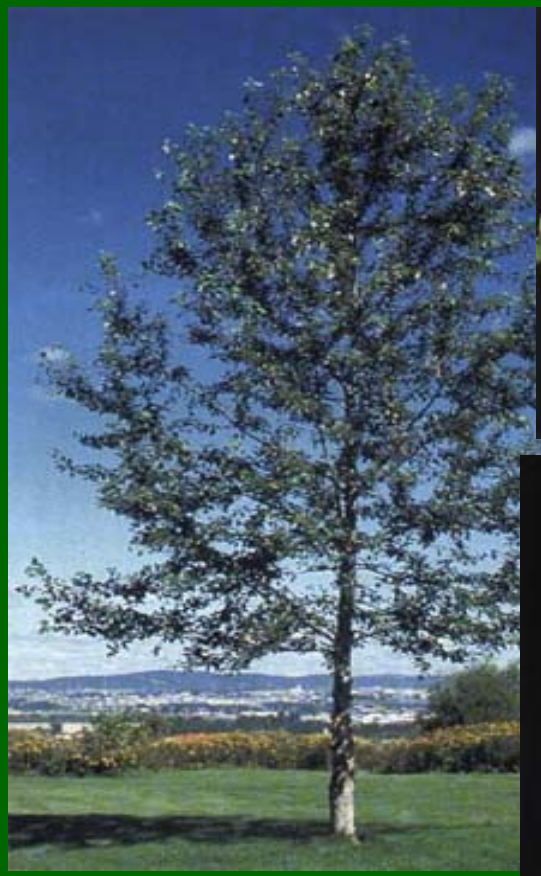
Bebb willow
(Salix bebbiana)
(FAC)

Red alder (*Alnus rubra)*
(FAC+)

l
e a)

FACU Plants in AK

Quaking aspen (*Populus tremuloides*)



Balsam poplar (*Populus balsamifera)*

Measures of Plant Species Dominance

- Percent cover
- Frequency of occurrence along a line transect
- 50/20-Dominance Test with no stratum having less than or equal to 5% absolute cover and all woody vegetation less than 3” dbh considered shrub

Definitions of Vegetation Strata

Tree	Woody plants ≥3.0 inches DBH, regardless of heigh
Sapling/Shrub	Woody plants <3.0 inches DBH
Herb	All Non-woody plants
Woody Vine	Woody climbing plants

Selection of Dominant Plants

For the sapling/shrub stratum:

Species Present	% Cover	Relative Cover	Cumulative Total
* Betula nana	25	33	33
* Potentilla fruticosa	20	27	60
* Myrica gale	15	20	80
Spirea beauverdian	10	13	93
Chamaedaphne calyculata	5	7	100
	75	100	

50% absolute frequency sum is 37.5%

Dominance (Cont'd.)

The 50/20 Dominance Test:

For each stratum in the plant community, dominant species are the most abundant plant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50 percent of the total dominance measure for the stratum, plus any additional species that comprises 20 percent or more of the total dominance measure for the stratum.

Dominance

BENEFITS OF THE DOMINANCE TEST

- Useful when dominant species readily characterize the overall community;
- Useful when dominant species are mostly FAC;
- Useful early in the growing season when some species may still be dormant;
- Many field investigators already familiar with this method.

Prevalence Index

- 80% of vegetative cover must be positively identified to indicator status (Plants with NI, NO are not used in calculation)
- Plants with less than 1% absolute cover are usually not included
- PI $\leq$ 3.00 equates to

Prevalence Index

OBL spp.	**10**	**x 1 =**	**10**
FACW spp.	**25**	**x 2 =**	**50**
FAC spp.	**30**	**x 3 =**	**90**
FACU spp.	**30**	**x 4 =**	**120**
UPL spp.	**0**	**x 5 =**	**0**
Total	**90**	**(A)**	**270**
		(B)	

P.I. = B/A = 2.84

Prevalence Index

BENEFITS OF THE PREVALENCE INDEX

- No need to identify strata (avoids calling low frequency species dominant just because they are the only species in that stratum);
- Uses absolute cover, not relative (easier to check other's data);
- Don't have to list in order of frequency or percent cover, easier to complete data sheet in field;
- More sensitive to situations with a lot of low cover species

Hydrophytic Vegetation

Other indicators:

- Visual observation of plant species growing under prolonged inundation or saturation
- Morphological adaptations = Vigor/Stunting
- Other: Cryptogam – only used in black spruce forests in Interior or Southcentral Subregions for Chapter 5 Difficult Situations/Problem Areas

VEGETATION

Visual Observation (1987 Manual):

Visual observation of plant species growing in areas of prolonged inundation and/or soil saturation. This indicator can only be applied by experienced personnel who have accumulated information through several years of field experience and written documentation that certain species commonly occur in areas of prolonged inundation and/or soil saturation during the growing season.

Data Sources on the Web

- Lists of Plant Species that Occur in Wetlands
  - http://www.fws.gov/nwi/Plants/list88.html
- USDA Plants Database
  - http://plants.usda.gov/

50/20 Method

Determine dominants by stratum.
If 5% or less in a stratum, treat with one of the other strata.

Determine sum of all absolute frequencies for stratum. That becomes denominator in determining relative frequency.

A short cut is to determine what would be 50% of total cover by stratum and 20% of total cover by stratum. Then you can avoid having to calculate relative frequency of each species.

Shrub stratum		Absolute cover	Relative cover	cumulative total
* Betula nana	FAC	25	33	33
* Potentilla fruticosa	FAC	20	27	60
* Myrica gale	OBL	15	20	80
Spiraea beauverdiana	FAC	10	13	93
Chamaedaphne calyculata	FACW	5	7	100
		75%	100%	

first accumulate 50% relative freq, i.e. Betula nana and Potentilla fruticosa
Then look for those with 20% or more relative cover, i.e. Myrica gal.

Shortcut: 50% of absolute freq. sum = 37.5%
20% of " " " " = 15%

3/3 of dominants are FAC, FACW, or OBL so 100% hydrophytic veg.

Note: PI = 2.53

Problem w/ 50/20

Where stratum has low cover

Arctic Recreational (along New Seward) example

Tree Stratum	Absolute Frequency	Relative Frequency	Indicator Status
* white spruce	5%	50%	FACU
* paper birch	5%	50%	FACU
Total Stratum	10%	100%	

Herb Stratum			
* Calamagrostis	90%	90%	FAC
Potentilla palustris	10%	10%	OBL
	100%	100%	

Dominance Test: 3 dominants: white spruce, paper
FACU FACU
Calamagrostis FAC
~~2/3~~
Only 1/3 FAC, FACW, OBL
So lacks hydrophytic veg.

Prevalence Index

$$\frac{(10\%)(1) + (0)(2) + (90)(3) + (10)(4) + 0(5)}{10 + 0 + 90 + 10 + 0}$$

(10%) OBL (1); (0) FACW (2); (90) FAC (3); (10) FACU (4); 0 UPL (5)

$$= \frac{320}{110} = 2.91 = PI$$

So has hydrophytic vegetation.

Arctic Recreational example continued-

If added a few low frequency FACU plants that might easily be under the dense Calamagrostis; note impact on prevalence index.

Rosa acicularis 5% FACU
Heracleum lanatum 5% FACU
Equisetum arvense 10% FACU

$$\frac{1(10)_{OBL} + 2(0)_{FACW} + 3(90)_{FAC} + 4(10+20)_{FACU\ new} + 5(0)_{UPL}}{10+90+30} =$$

$$\frac{400}{130} = 3.08$$

technically no longer has hydrophytic vegetation

Relative to 50/20

Rosa would be the only shrub. With only 5% should handle it with either tree or herb stratum. Recommend herb where it would not be a dominant. The two other new "herbs" would not alter the dominants from herb stratum.

So, no change in determination.

Example where 50/20 does better where most species are FAC

Herb stratum

* Calamagrostis FAC 50%
  Sanguisorba officinalis FAC 5%
  ~~Cornus canadensis FACU 5%~~

55% total

50% of total = 27%
20% of total = 11%

Shrub stratum

* Betula nana FAC 20%
* Potentilla fruticosa FAC 20%
* Rosa acicularis FACU 15%

55% total

50% of total = 27%
20% of total = 11%

four dominants (marked with asterisk): 3FAC, 1FACU
3/4 are FAC, FACW, OBL
75% so hydrophytic vegetation by 50/20

---

by Prevalence Index

$$\frac{1(0)_{OBL} + 2(0)_{FACW} + 3(50+20+20+5)_{FAC} + 4(15)_{FACU} + 5(0)_{UPL}}{95+15} =$$

$$\frac{3(95)+60}{110} = \frac{285+60}{110} = \frac{345}{110}$$

$$= 3.14$$

so not hydrophytic by PI

Interesting 50/20 Example

Herb stratum

		Abs cover
* Mertensia paniculata	FACW	12
* Veratrum viride	FACW	12
* Gymnocarpium dryopteris	FACW	10
* Heracleum lanatum	FACW	10
Calamagrostis	FAC	8
~~Stenanthium occidentale FACW~~		
‡ Sanguisorba canadensis	FACW	6
Streptopus amplexifolius	FAC	6
Epilobium angustifolium	FACW	5
Aquilegia formosa	FACW	4
Elymus glaucus	FACU	3
Delphinium glaucum	FACW	2
Total		78%

must sum most common four to accumulate 50% relative (i.e. 39% absolute)

No species here reaches the 20% relative cover (i.e. 15.6%).

50% of total = 39% abs
20% of total = 15.6% abs.

Shrub stratum

* Alnus sinuata	FAC	90
Salix glauca	FAC	25
Salix barclayi	FAC	20
Viburnum edule	FACW	5
Rosa acicularis	FACW	2
Total		142%

Alnus is the only dominant due to being >50% of total.
~~Alone is~~
The other species are not 20% or more (i.e. ≥ 28.4%)

50% of total = 71% abs
20% of total = 28.4% abs.

Thus, four herbs and one shrub are dominants
1/5 is FAC, FACW or OBL so not hydrophytic.
Note that 45% of absolute cover, i.e. the two willows, are ignored by this calculation.